

533177

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
13 May 2004 (13.05.2004)

PCT

(10) International Publication Number
WO 2004/039527 A2

(51) International Patent Classification⁷: B23K 9/235,
15/00, 20/12, C22F 1/04

(21) International Application Number:
PCT/GB2003/004646

(22) International Filing Date: 28 October 2003 (28.10.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0225518.0 1 November 2002 (01.11.2002) GB

(71) Applicant (for all designated States except US): AIRBUS
UK LIMITED [GB/GB]; New Filton House, Filton, Bris-
tol BS99 7AR (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): ILYUSHENKO,

Rostyslav [UA/GB]; Flat 33, 71 Pembroke Road, Bristol
BS8 3DR (GB). MAZIARZ, Robert, Jan [GB/GB]; 71
Hill House Road, Downend, Bristol BS16 5RT (GB).
DAVIES, Huw [GB/GB]; 12 Monks Park, Malmesbury,
Wiltshire SN16 9JF (GB).

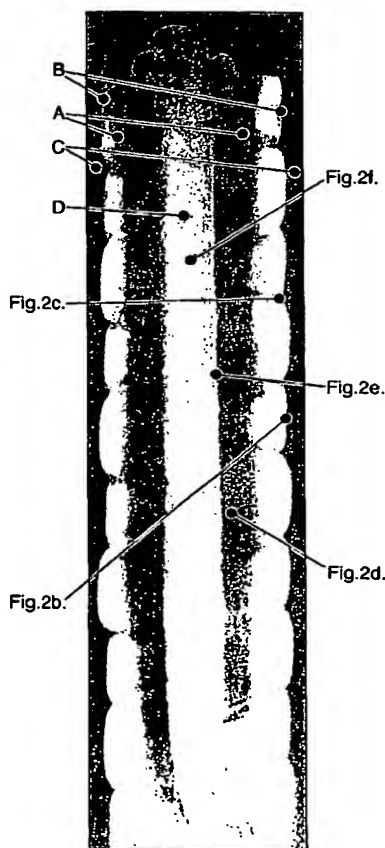
(74) Agents: PEARSON, James, Ginn et al.; Abel & Imray,
20 Red Lion Street, London WC1R 4PQ (GB).

(81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE,
GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR,
KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK,
MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT,
RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR,
TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

[Continued on next page]

(54) Title: WELDING METHOD



(57) Abstract: Two aluminium alloy work-pieces are welded together. Firstly, a por-
tion (2) of each work-piece (1) is prepared, the preparation including the performance
of a surface treatment, such as friction stir welding, that results in a region (A) ex-
tending from the exterior surface into the work-piece having a grain structure that is
finer than the grain structure of the work-piece outside (region C) that region. Then the
work-pieces are welded together by means of a fusion welding process, such as electron
beam welding, that joins the respective prepared portions (2) of the two work-pieces (1).
The preparation of the work-pieces is so performed that said region (A) extends into
the work-piece to a depth that exceeds the depth of material (region D) that is caused
to melt during the fusion welding process.

BEST AVAILABLE COPY

WO 2004/039527 A2



European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

- *without international search report and to be republished upon receipt of that report*

BEST AVAILABLE COPY